1 Purpose

To analyze alphabet frequency to decode messages.

2 Duration Of Lesson

Approximately 55 minutes

3 Additional Topics Addressed

None

4 Objectives

At the conclusions of this lesson students will be able to:

- Calculate the frequency of letters from class data
- Use class data to help decode a message

5 Standards & Benchmarks

MATHEMATICS

PROBABILITY & STATISTICS

Create, compare, and evaluate different graphic displays of the same data, using histograms, frequency polygons, cumulative distribution functions, pie charts, scatter plots, stem-and-leaf plots, and box-and-whisker plots. Draw these by hand or use a computer spreadsheet programs.

PS.1.1

INTEGRATED MATHEMATICS I

Students find measures of the center and variability of a set of data, as well as construct and analyze data displays and plot least square regression lines.	**IM1.4**
Construct a frequency table for a set of data.	**IM1.4.10**

BUSINESS MATH

Construct and interpret frequency distribution.	**BMTH.1.3.3**

BUSINESS, MARKETING, & INFORMATION TECHNOLOGY

INFORMATION TECHNOLOGY

Students demonstrate knowledge of communication standards for networks.	**IT.13.7**
Demonstrate knowledge of various encoding and framing methods (e.g., Manchester, B8Z8)	**IT.13.7.3**
Students demonstrate knowledge of data-encoding basics	**IT.13.8**

6 Vocabulary

Frequency – the number of times a letter occurs in a sample.

7 Materials

Each student should have a copy of the class data from the previous lesson and a copy of the attached questions.

8 Additional Resources

None.

9 Procedures & Methods

A. Introduction

Yesterday we collected data from the words and letters contained in a 100 word sample from your library book. I have made copies of the data sheet we had on the overhead for each of you. Remember that we were collecting this data to use it to help decode messages much like a cryptographer does. This is a simple exercise to illustrate how messages can be decoded. It is only one of many methods and much of the current decoding is done by sophisticated software developed by engineers.

B. Development

Divide students into groups and assign each group a portion of the probability for each letter and the percent it represents. Or if you prefer, have students work in groups of 2 or 3 to complete all of the data (this will extend the length of the lesson). Have students place their information on an overhead, then have students answer the attached questions.

C. Practice

Questions need to be completed for discussion on day 3.

D. Independent Practice- None.

E. Accommodations (Differentiated Instruction)

Students who may not have a television may need extra time to make arrangements to view the program from another source. Students may find a similar word game on the internet. Students who are visually or hearing impaired may need adaptive devices to participate in the lesson. Alternately, the teacher may need to record the game show, and replay it at school.

F. Checking For Understanding

Teacher will check with each group to be sure students are on task and are on the right track.

10 Evaluation

Check answers to the questions based on the data from your class.

11 Teacher Reflection

The teacher will complete this section after teaching the lesson.

12 Resources & Media

- Each student should have a copy of the class data from the previous lesson and a copy of the attached questions

- Television

Name _____

Date _____

1. What is the total number of letters the class counted?

2. Write the vowels in order from the greatest number of times used to least used.

3. Write the probability for each vowel and find the percent it represents.

Pr(a) =

Pr(e) =

Pr(i) =

Pr(o) =

Pr(u) –

And sometimes

Pr(y) =

4. Write the 7 most used consonants in order from greatest number of times used to least used.

5. Write the probability for each of those seven consonants and find the percent it represents.

6. Using your data from Wheel of Fortune, write the top four consonants guessed to the least number of times guessed.

7. Write the probability of these four consonants and find the percent of each.

8. Using your data from Wheel of Fortune, write the top four vowels guessed to the least number of times guessed.

9. Write the probability of these four vowels and find the percent of each.

10.   How does the contestants' choice of consonants compare with the class data? How does the choice of vowels compare with the class data? Write at least five sentences and support your statements with the data.

11.   The winner gets to play for extra prize money. The following letters are provided to the contestant:

R   S   T   L   N and E.

Why do you think these letters are provided? Use the class data to support your answer.

12.   If you were playing in the extra round, what three consonants and vowel would you guess? Support your choices with data the class has collected.